

DETAILED ACTION

The following is a supplemental action to the final dated 3/26/2010. The Final Action dated 3/26/2010 contained inadvertent typos. This supplemental action is to clarify those inadvertent typos such that the rejection is sufficiently clear and the language used by the examiner in the rejection clearly matches that used by the applicant.

Response to Amendment

1. Amendment to the claims received 12/18/2009 has been entered. Claims 1-2, 5-7, 10, 13-14 and 16-17 have been cancelled. Claims 18-30 have been added.

Response to Arguments

2. Applicant's arguments filed 12/18/2009 have been fully considered but they are not persuasive.

Applicant argues with respect to claim 3 that the combination of Hayakawa et al. and Merelli do not disclosed the claimed invention of claim 3, more particularly that Merelli does not disclose all the features with regards to a ring fitting groove formed in an inner periphery of the cylinder chamber near and open end of the cylinder chamber, an engaging groove formed in an outer periphery of the plunger near a rear end of the plunger, and a radially elastically deformable elastic ring received in the ring fitting groove in a radially expanded state and being configured to be radially compressed in said engaging groove. The examiner disagrees and feels that Merelli does teach all of these features, therefore resulting in the combination of Hayakawa et al. and Merelli as disclosing all elements of the claimed invention. The examiner notes, however, that

there are two possible interpretations of the tensioner of Merelli, and the discussion of the two interpretations, instead of the single cited of the previous office action, may help clarify why the examiner feels that Merelli teaches the disclosed features. With reference to Figures 1 and 2 of Merelli, Merelli teaches a tensioner housing 20 having a bore in which a sleeve 32 is disposed, the sleeve having another bore having a piston 31 disposed therein. These three features can be interpreted as the sleeve 32 being part of the cylinder chamber, the sleeve having a ring fitting groove 322 on its inner periphery to engage with a ring 313 disposed within an engaging groove 312 in the outer periphery of the plunger 31, and as the sleeve 32 is being interpreted as part of the cylinder chamber, Merelli discloses a ring fitting groove in the inner periphery of the cylinder chamber near an open end and an engaging groove in the outer periphery of a plunger near a rear end and a ring disposed in the engaging groove for expanding into and engaging in the ring fitting groove. This is the interpretation as taken in the previous office action.

However, a second interpretation is also possible. One may interpret the sleeve 32 as being part of the piston 31 instead of part of the cylindrical chamber. Using this interpretation of the reference Merelli discloses a housing 20 having a cylindrical chamber having a piston composed of two parts 31 and 32 disposed therein, the cylindrical chamber having a ring fitting groove 202 formed in an inner periphery thereof near the open end, the piston 31,32 having an engaging groove 323 formed in an outer periphery thereof near a rear end (here it is noted that when the piston is composed of elements 31 and 32 that in the expanded state, Fig. 2, that the engagement groove 323

is disposed more towards the rear than the front of the piston), a ring 324 disposed in the engagement groove 323 of the piston for expanding and engaging with the ring engagement groove 202 of the cylindrical chamber.

Therefore, with either of the two explained interpretations, the examiner feels that Merelli does disclose the required elements of the claimed invention such that the combination of Hayakawa et al. and Merelli taken in combination disclosed the invention as claimed.

With regards to claim 3 and consideration of the subject matter of new claims 18-20, the examiner further notes that the claim requirements of claim 3 require “a radially elastically deformable elastic ring fitting in said ring fitting groove in a radially expanded state” and “elastic ring being engagable in said engaging groove and being configured to be radially compressed in said engaging groove...” these claim limitations do not explicitly require that the elastic ring be disposed in the cylindrical groove and expand into the plunger groove and does allow for the interpretation of being disposed in the plunger groove and expanding into the cylindrical groove. Therefore it is also noted that new claims 18-20 further make this distinction.

As per the arguments with regards to newly added independent claim 21, the examiner points to the rejection of claim 21 below and notes that Merelli discloses the use of the concept of two cooperating grooves with a ring expandable between the two grooves such that when the ring expands and occupies a space of both cooperating grooves the piston is unable to move further in an outward direction with respect to the cylindrical chamber. And as the only difference between the prior art and the disclosed

invention is that the prior art discloses the ring being disposed in the groove of the plunger and expanding into the groove of the cylinder chamber while the claimed invention discloses the ring being disposed in the groove of the cylinder chamber and expanding into the groove of the plunger that it obvious and within the skill of one of ordinary skill in the art to locate the elastic ring in the cylinder groove instead of the piston groove as there are only a limited number of configurations possible to achieve the desired result and the selection of the ring being disposed in the groove of the cylinder and expanding into the groove of the piston instead of being disposed in the groove of the piston and expanding into the groove of the cylinder is merely a design choice that one of ordinary skill in the art would have found obvious at the time of the invention.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 3-4, 11-12, 18-22, 25-26 and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayakawa et al. (US 7,037,229) in view of Merelli (US 6,244,982 B2).

Hayakawa et al. discloses a chain tensioner (Fig. 5) comprising:

- a housing (30) formed with a cylinder chamber (31), a plunger (32) slidably mounted in said cylinder chamber (Fig. 5), said cylinder chamber defining a pressure chamber behind said plunger (34, Col. 5, Ln. 25-34);
- a spring (33) mounted in said cylinder chamber and biasing said plunger outwardly away from said cylinder chamber (Col. 5, Ln. 25-34);
- a retraction restrictor (43, 45) mechanism for preventing said plunger from retracting toward a closed end of said cylinder chamber beyond a predetermined distance (Col. 5, Ln. 44-53);
- an oil supply passage (35) formed in said housing and communicating with said pressure chamber (Fig. 5), said oil supply passage configured to supply a hydraulic oil such that a pushing force applied to said plunger is damped by the hydraulic oil;
- wherein a bore (42) is formed in said plunger such that said plunger includes an outer surface and an inner surface, wherein a screw rod (44) is disposed at least partially within said bore (Col. 5, Ln. 44-53),
 - wherein said retraction restrictor mechanism includes an internal thread (43) formed in said bore on said inner surface and an external thread (45) formed on said screw rod (Col. 5, Ln. 44-53).

Hayakawa et al. fails to explicitly disclose an engaging groove formed in an outer periphery of said plunger near a rear end of said plunger located inside said cylinder chamber and a radially elastically deformable elastic ring received in said engaging groove in a radially compressed state and a ring fitting groove formed in an inner periphery of said cylinder chamber near an open end of said cylinder chamber, said elastic ring being engagable in said ring fitting groove and being configured to radially expand in said ring fitting groove such that an inner diameter of said elastic ring is smaller than an outer diameter of said plunger and said elastic ring is disposed in both said engaging groove and said ring fitting groove to prevent axial movement of said plunger in a direction away from said closed end of said cylinder chamber, wherein the resistor ring and elastic ring constitute separate structures such that the elastic ring is operable to prevent axial movement of the plunger independent of the resistor ring.

Merelli discloses a chain tensioner (20) wherein a plunger (31) has an engaging groove (312) formed in an outer periphery of said plunger near a rear end of said plunger located inside said cylinder chamber (Fig. 2) and a radially elastically deformable elastic ring (313) received in said engaging groove in a radially compressed state (implicitly taught that the ring would have to be compressed in order to engage the groove 322) and a ring fitting groove (322) formed in an inner periphery of said cylinder chamber near an open end of said cylinder chamber (Fig. 2), said elastic ring being engagable in said ring fitting groove and being configured to radially expand in said ring fitting groove such that an inner diameter of said elastic ring is smaller than an outer diameter of said plunger and said elastic ring is disposed in both said engaging groove

and said ring fitting groove to prevent axial movement of said plunger in a direction away from said closed end of said cylinder chamber (Fig. 2, Col. 3, Ln. 18-25, LN. 60-67).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the tensioner of Hayakawa et al. to include an elastic ring, an engaging groove on the outer periphery of the plunger and a ring fitting groove in the inner periphery of the cylinder, as taught by Merelli, for the purpose of preventing the plunger from extending outward more than a predetermined amount.

As per claims 18-21 and 28-30, Modified Hayakawa et al. fails to explicitly disclose the elastic ring is expanded by the outer periphery of the plunger, the elastic ring disposed in the fitting groove such that the outer periphery of the plunger contacts the inner periphery of the elastic ring as the plunger slides relative to the cylinder chamber. However it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the tensioner of Modified Hayawaka et al. to include the elastic ring is expanded by the outer periphery of the plunger, the elastic ring disposed in the fitting groove such that the outer periphery of the plunger contacts the inner periphery of the elastic ring as the plunger slides relative to the cylinder chamber, as this is provided by the reversal of parts and locating the ring in the cylindrical chamber groove such that it expends into the plunger groove instead of the disclosed ring being located in the plunger groove and expanding into the cylindrical groove, since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. *In re Einstein*, 8 USPQ 167. *In re Japikse*, 86 USPQ 70. It is

further noted that as Merelli discloses two corresponding grooves, one located in the inner periphery of the cylinder chamber and one located in the outer periphery of the plunger, and an elastic ring disposed such that when the two corresponding grooves are aligned, the elastic ring expands into both grooves such as to prevent further sliding of the plunger outward relative to the cylinder chamber, and as Merelli discloses this concept there would be a limited number of ways for one of ordinary skill in the art to implement such, one being to have the ring disposed in the plunger and expand into the cylinder and the other to have the ring disposed into the cylinder and expand into the plunger and that the choice of such is merely a design choice of one of ordinary skill in the art as to which meets the needs of the given application better.

As per claims 4 and 22, Merelli et al. further discloses the engaging groove has a first axial end surface and a tapered second axial end surface, said tapered second axial end surface being axially opposed to said first axial end surface and being disposed closer to said closed end of said cylinder chamber than said first axial end surface (Fig. 2, Col. 3, Ln. 31-37).

Merelli et al. discloses the tapered surface on the engaging groove that receives the ring after the ring expands to occupy both grooves, but does not explicitly disclose the tapered surface being applied to the ring fitting groove, however it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the tensioner of Modified Hayawaka et al. to include the ring fitting groove having a tapered surface in addition to the engaging groove to ensure a smooth transitional movement of the ring.

As per claims 11-12 and 25-26, Merelli et al. is silent as to the material of which the elastic ring is made from, however it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the tensioner of Hayakawa et al. to include the elastic ring being made from resin, since it has been held that to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

6. Claims 8-9 and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayakawa et al. (US 7,037,229) in view of Merelli (US 6,244,982 B2) and further in view of Kuznets et al. (US 5,700,214).

Merelli et al. is silent as to the shape and material of the elastic material, however it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the tensioner of Hayakawa et al. to include the elastic ring being made from steel, since it has been held that to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Kuznets et al. discloses a hydraulic tensioner (10) in which a retainer ring (86) has a circular cross section (Fig. 3, Fig. 3B) and is a C-shaped member with two separate ends (Fig. 3A).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the chain tensioner of Hayakawa et al. to include the retainer ring being a C-shaped member, as taught by Kuznets et al., for the purpose of allowing for

thermal expansion. Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the elastic ring being a c-shaped member, since it has been held that it is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that a particular configuration was significant. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

7. Claims 15, 18 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayakawa et al. (US 7,037,229) in view of Merelli (US 6,244,982 B2) and further in view of Poiret et al. (US 6,849,012 B2).

Merelli fails to explicitly disclose the radially expanded state of said elastic ring constitutes a state in which the elastic ring is expanded by a force external to the elastic ring.

Poiret et al. discloses a tensioner (1) having an elastic ring (16) wherein the expansion and compression of the elastic ring is facilitated by means of tapered edges (21, 29) of grooves (14, 24) located in the inner periphery of the housing (1) and the outer periphery of the plunger (5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the tensioner of Hayakawa et al. to include the elastic ring is expanded by a force external to the elastic ring, as taught by Poiret et al., for the purpose of ensuring and facilitating the expansion of the elastic ring.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNA MOMPER whose telephone number is (571)270-5788. The examiner can normally be reached on M-F 6:00-3:30 (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Siconolfi can be reached on (571) 272-7124. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

am

/Robert A. Siconolfi/
Supervisory Patent Examiner, Art
Unit 3657